

DIRIS A17

Multifunction meters - MFM

Multi-measurement meter - dimensions 72 x 72 mm

Operating instructions **EN**



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1. Documentation

All **DIRIS A17** documentations are available on the website at the following address:

www.socomec.com/en/documentation-diris-a17



2. Danger and warning

This equipment must be mounted only by professionals.

The manufacturer shall not be held responsible for failure to comply with the instructions in this manual.

2.1. Risk of electrocution, burns or explosion

- The device must be installed and serviced only by qualified personnel.
- Prior to any work on or in the device, isolate the voltage inputs and auxiliary power supplies and short-circuit the secondary winding of all current transformers (PTI SOCOMEC).
- Always use an appropriate voltage detection device to confirm the absence of voltage.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Always supply the device with the correct rated voltage.

Failure to take these precautions could cause serious injuries.

2.2. Risk of damaging device

Check the following:

- the voltage of the auxiliary power
- the frequency of the distribution system (50 or 60 Hz)
- the maximum voltage across the voltage-input terminals, (V1, V2, V3 and VN) 500 VAC phase-to-phase or 289 VAC phase-to-neutral
- a maximum current of 6 A on the current-input terminals (I1, I2 and I3).

3. Preliminary operations

For personnel and product safety, please carefully read the contents of these operating instructions before installation.

Check the following points as soon as you receive the **DIRIS A17** package:

- the packing is in good condition,
- the product has not been damaged during transport,
- the product reference number conforms to your order,
- the package contains the product fitted with a pull-out terminal block and a Quickstart,

4. Presentation

The **DIRIS A17** is a 72x72 mm compact multifunction meter for measuring electrical network parameters. The **DIRIS A17** provides measurements of voltage, current, power and energy. With display and push buttons, users can easily access to all product functionalities. It includes an input and an output, and depending on the reference, it can include a communication bus as well as the measurement of the harmonic distortion rate.

4.1. Main functions

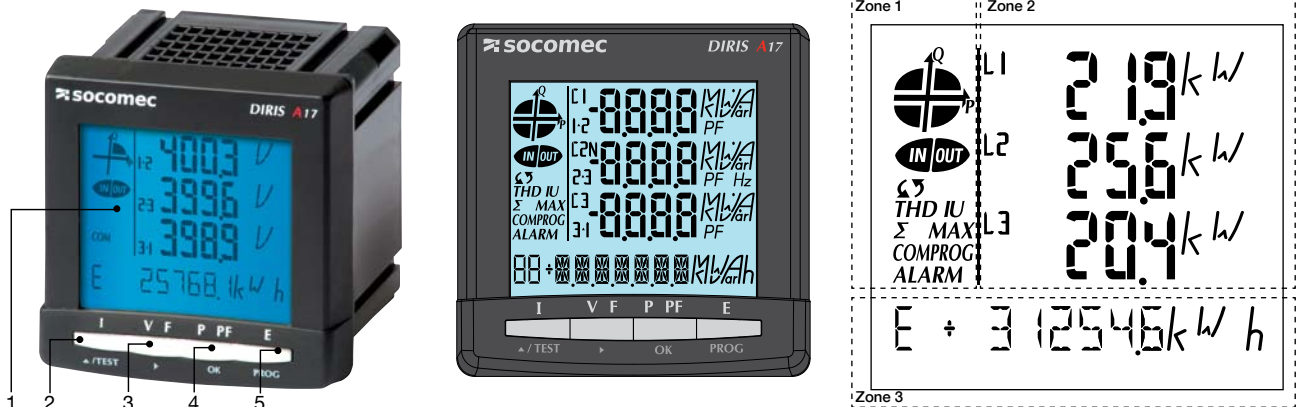
Multifunction meters - PMD*

- Measurement of electric variables: I, U, V, F
- Power, Power Factor and Energy
- THD (according to reference)
- 1 input / 1 output
- Alarms
- RS 485 MODBUS communication (according to reference)

| Description | Reference |
|--|-----------|
| DIRIS A17 with pulse output | 4825 0101 |
| DIRIS A17 with RS485 Modbus communication | 4825 0102 |
| DIRIS A17 with RS485 Modbus communication and THD | 4825 0103 |

*Performance Measuring and monitoring Device (IEC 61557-12)

4.2. Display views



1. Backlit LCD display.
2. Currents (instantaneous and maximum) and current THD.
3. Voltages, frequency and voltage THD.
4. Active, reactive, and apparent power (instantaneous and max. values) and power factor.
5. Powers.

Zone 1

- Geometric representation of active and reactive Power
- Status of input/output
- Bad phases order
- THD IU** Current or voltage THD measurement
- Σ** Total power
- MAX** Current or power max value
- COM** In communication
- PROG** Programming mode selection
- ALARM** Alarm presence

Zone 2 Electrical values measurement with Phases and/or Neutral indication

Zone 3 Total energy measurement

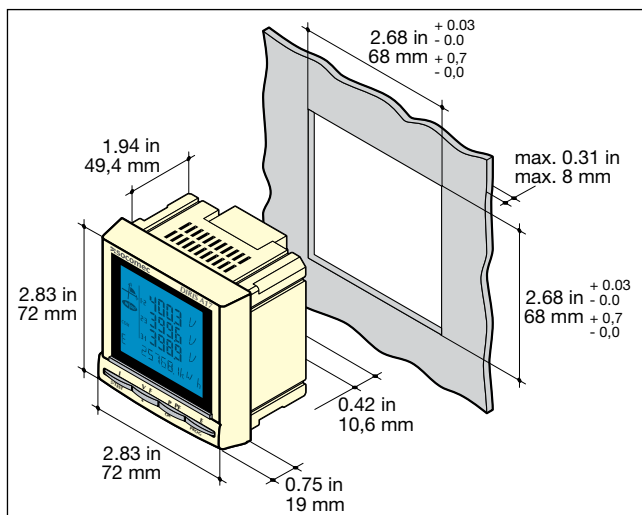
5. INSTALLATION

5.1. Recommendation

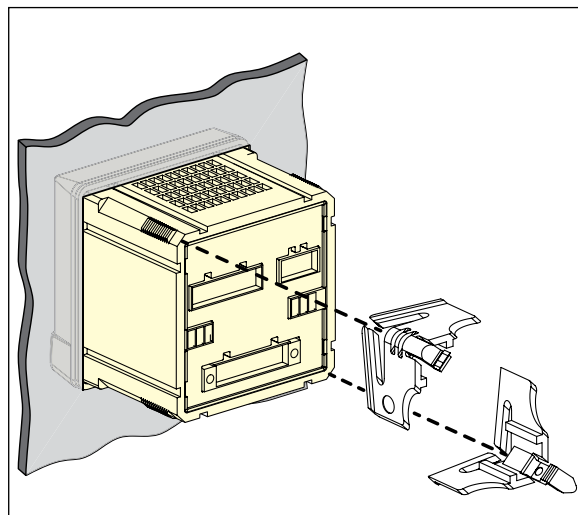
- avoid proximity to systems which generate electromagnetic interference,
- avoid vibrations with accelerations in excess of 1 G for frequencies below 60 Hz.

5.2. Cut-out diagram

- Panel mount of the device can be done according to the following cut-out diagram:

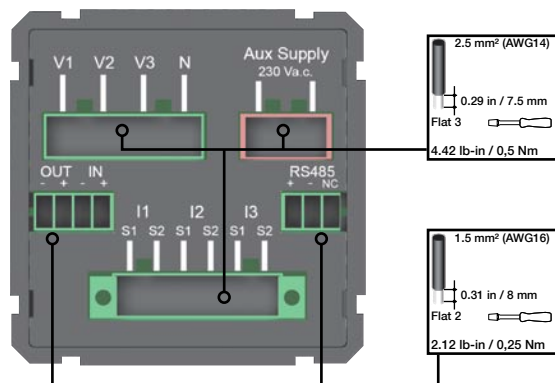


- Two fixing clips are used to fix the device to the panel.



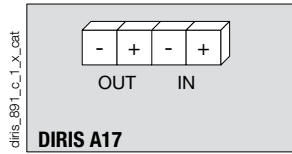
5.3. Terminals

Each CT's secondary winding must be short-circuited when disconnecting the DIRIS. This can be done automatically using one of Socomec's catalogue products: the PTI (ref.: 4990 **0521**). Please contact us for further information.



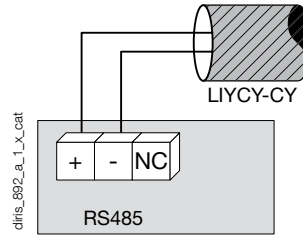
5.4. Connections

5.4.1. Connection (input / output)



Power supply between 8 and 30 VDC for the input /output.

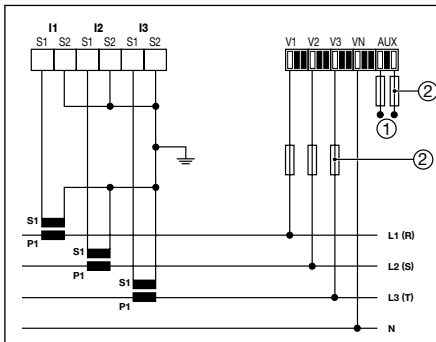
5.4.2. Communication connection



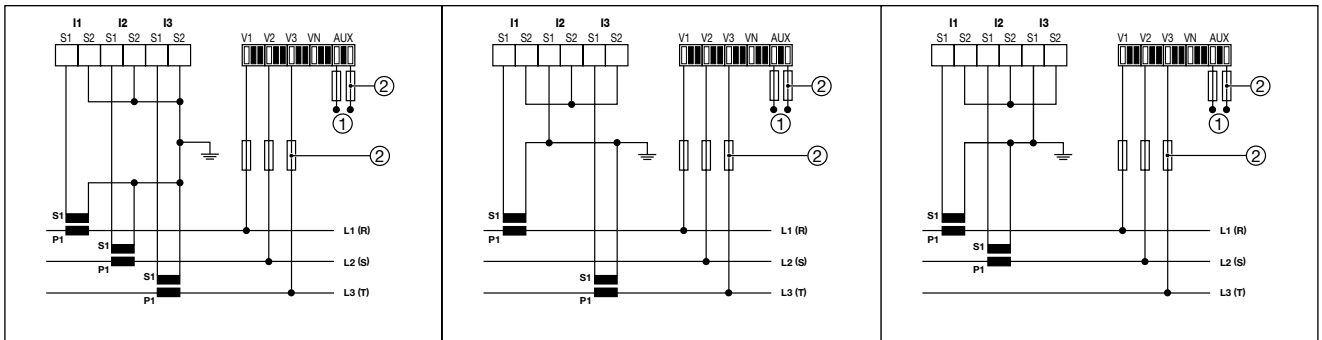
NC: not connected. can be used for shield continuity.

5.4.3. Network connections

5.4.3.1. Unbalanced three-phase network (4NBL)

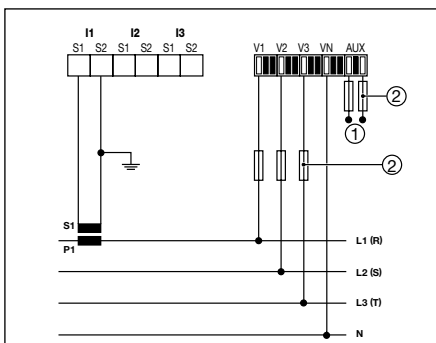


5.4.3.2. Unbalanced three-phase network (3NBL)

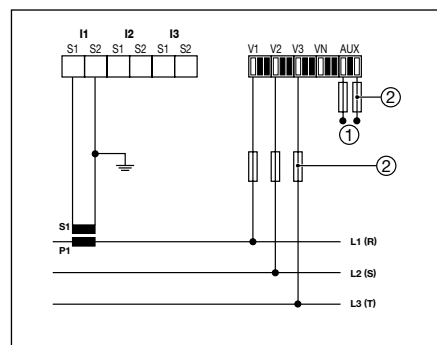


The solution with 2 CTs with the 2nd and 3rd phase current calculated via vectorial summation, results in an 0.5% reduction in phase accuracy.

5.4.3.3. Balanced three-phase network (4NBL)



5.4.3.4. Balanced three-phase network (3NBL)



5.4.4.

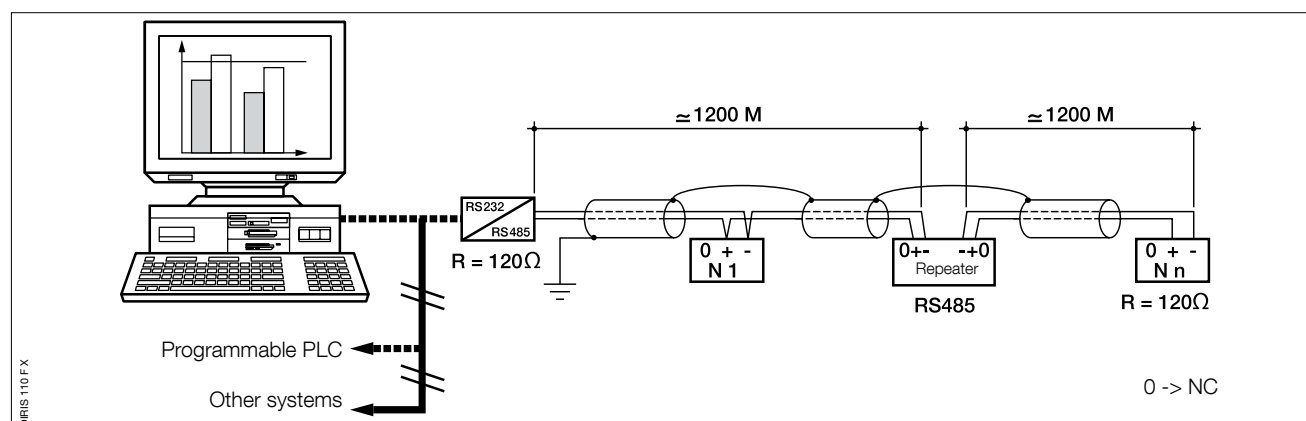
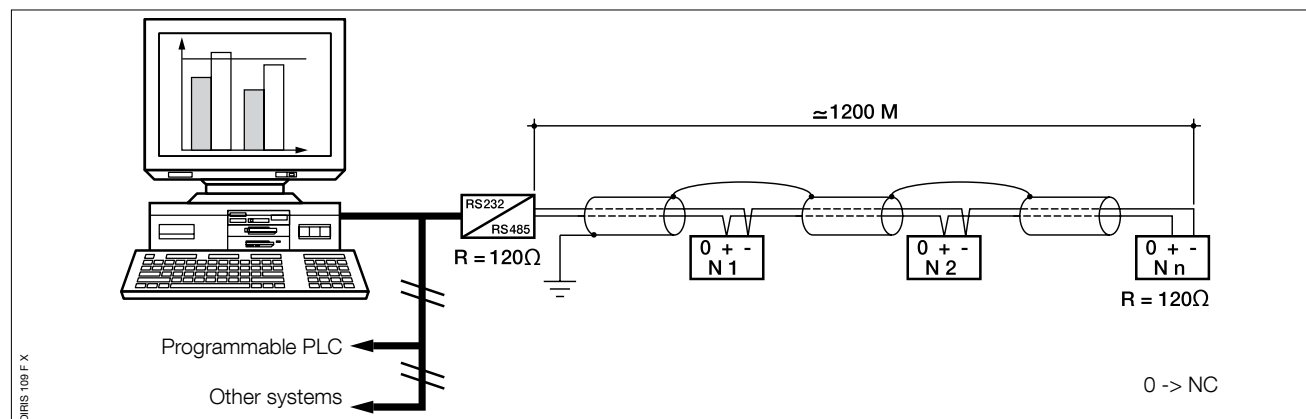
6. Communication MODBUS®

6.1. General Information

The MODBUS® communication bus is available on **DIRIS A17** (ref. 4825 0102 et 4825 0103).

It is achieved via an RS485 serial link (2 or 3 wires) for using products from a PC or an API.

In a standard configuration, an RS485 link enables the interconnection of 32 products to a PC or an automaton over a distance of 1200 meters.



6.2. Recommendations

It is necessary to use a shielded twisted pair (LIYCY type). In a disturbed environment or large network (in terms of length) we recommend the use of a shielded twisted pair (type LIYCY-CY).

A repeater should be used if the distance of 1200 m and/or maximum number of 32 products are exceeded.

A 120 ohms resistance must be fixed at both ends of the link.

6.3. Communication structure

The MODBUS® used by the product involves a dialogue using a master-slave structure. The mode of communication is the RTU (Remote Terminal Unit) using hexadecimal characters of at least 8 bits.

Structure of the MODBUS® sequence (question master -> slave):

| Slave address | Function code | Address | Number of words to be read | CRC 16 |
|---------------|---------------|---------|----------------------------|---------|
| 1 byte | 1 byte | 2 bytes | 2 bytes | 2 bytes |

According to the MODBUS® protocol, transmission time must be less than 3 silences, i.e. the emission time of 3 characters so that the message is processed by the **DIRIS A17**.

To use this information correctly, it is necessary to use the MODBUS® functions according to the codes:

- 3: to read n words (maximum 128).
- 6: to write one word.
- 16: to write n words (maximum 128).

Note:

1 word<=> 2 octets <=> 16 bits

2 word<=> 4 octets <=> 32 bits

When selecting the slave address 0, a message is sent to all the devices present on the network (only for functions 6 and 16).

Note: The response time (time out question/answer) is 250 ms.

6.4. Register table

The communication tables and associated explanations are available in the documentations page of **DIRIS A17** on internet web site at the following address:

www.socomec.com/en/documentation-diris-a17

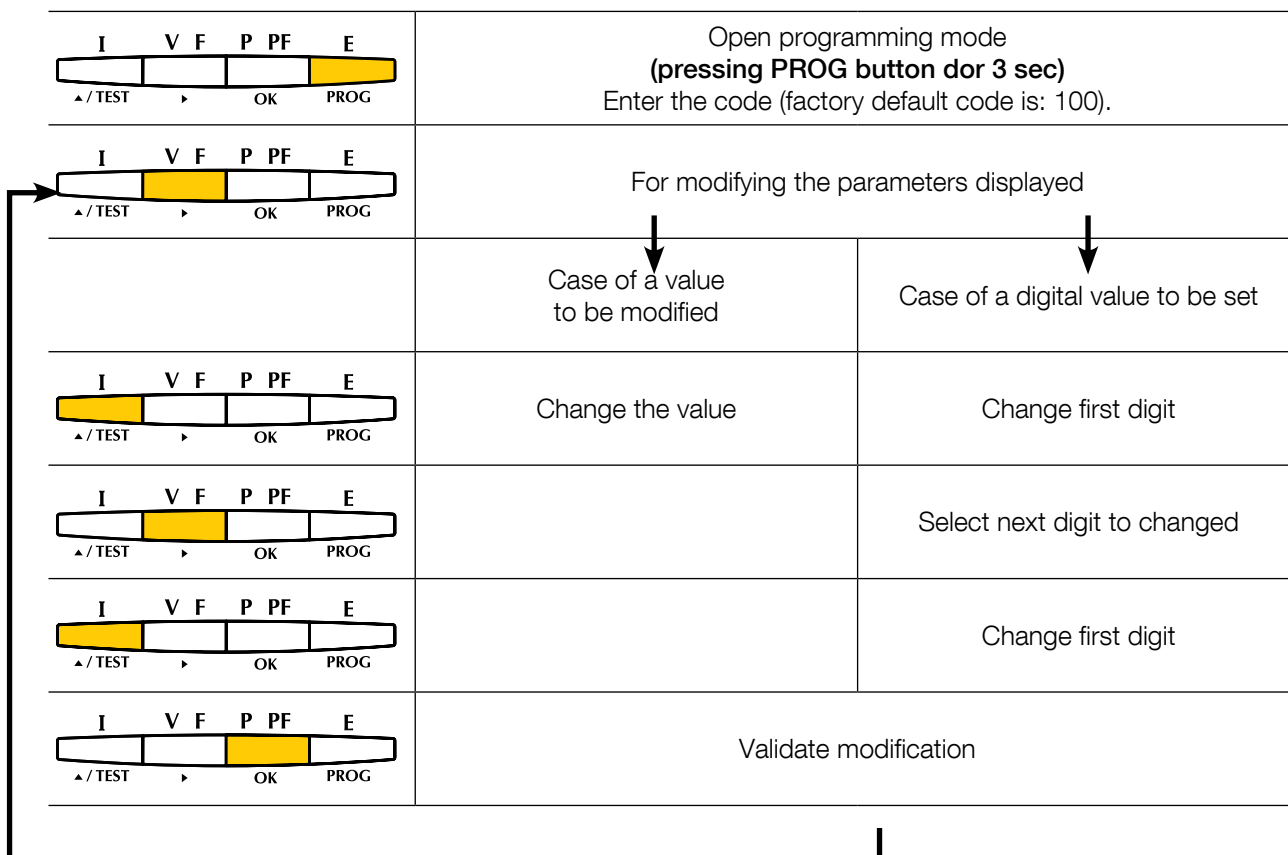


7. Programming

Programming can be achieved from the Easy Config configuration software or directly from the **DIRIS A17** display. Refer to following paragraphs for programming from the display.

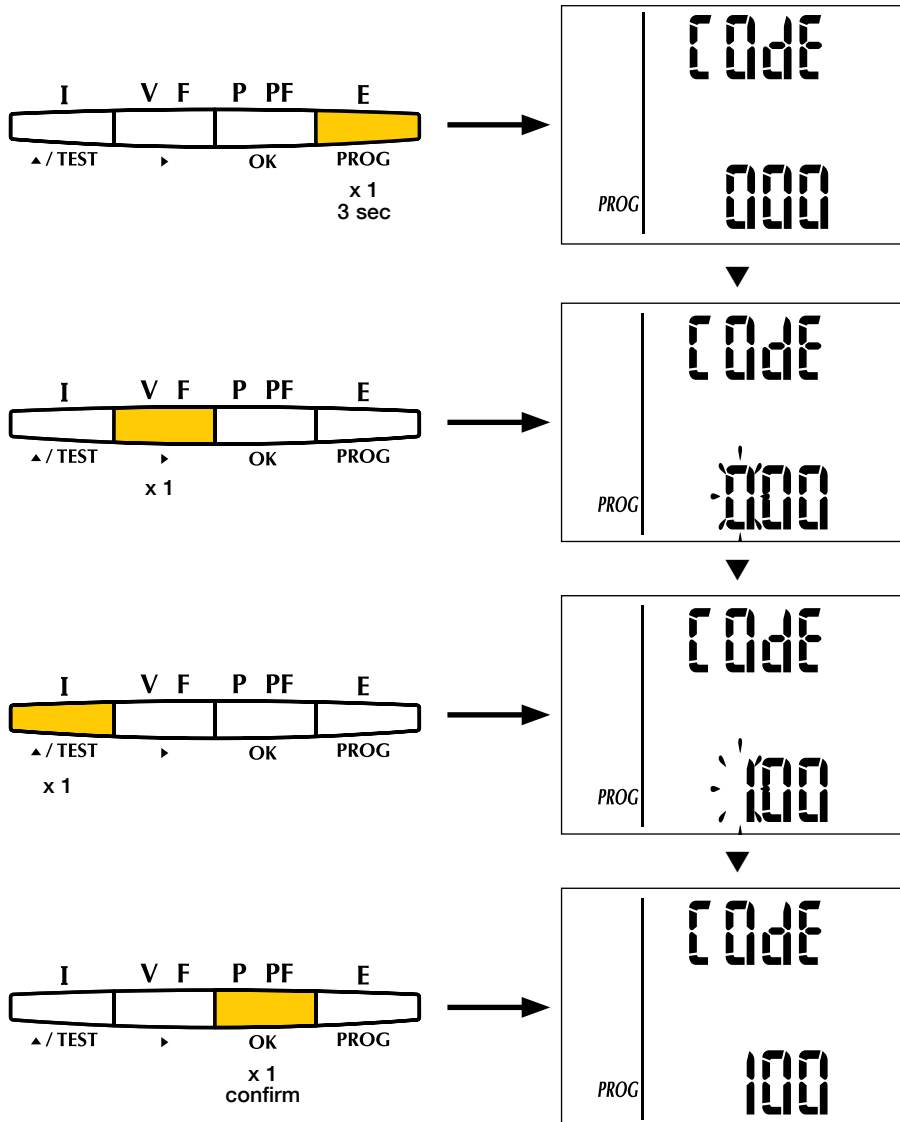
7.1. Navigation principle

The programming mode allows to modify parameters such as network type, integration time, input/output, alarms or communication parameters. The process to navigate inside the programming mode is described in the following steps:



7.2. Access to programming mode

By pressing "E/PROG" button for 3 seconds, device will enter the programming mode. Default code is: 100.



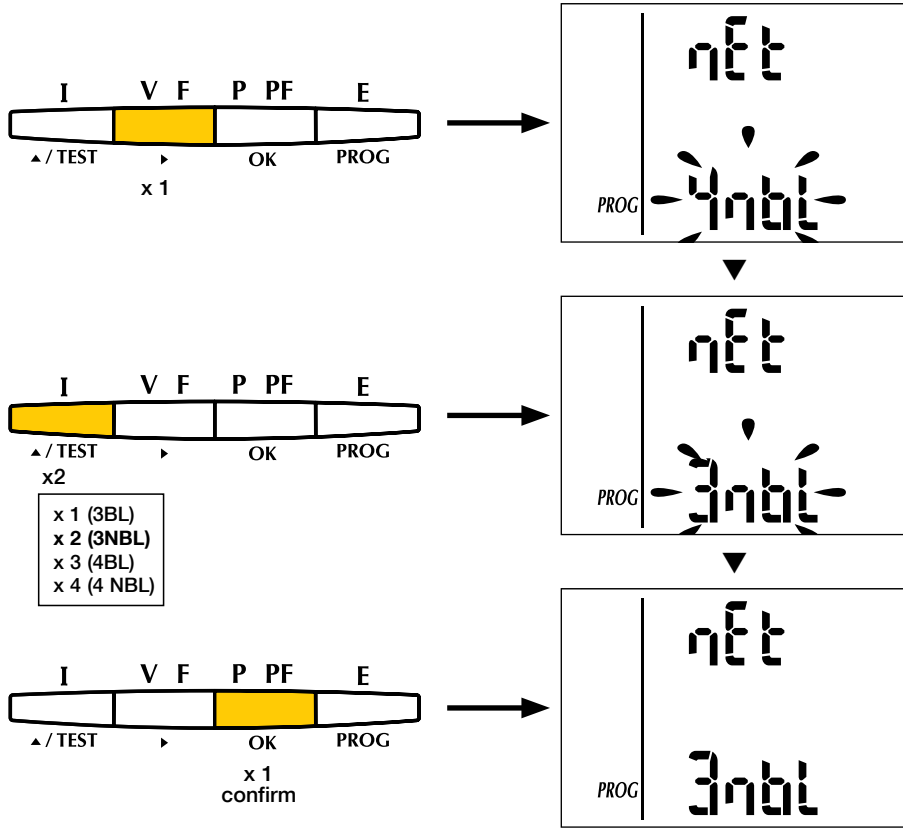
If the entered code is the right one, device will enter programming mode successfully and remains in this mode until user finishes the session by pressing "PROG" button for 3 seconds.

Attention: For a timeout of 60 seconds without activity on the pushbuttons the device leaves the programming mode without saving possible changes.

7.3. Example: network selection.

In programming mode (see page 10), go to screen "Network type - nEt"

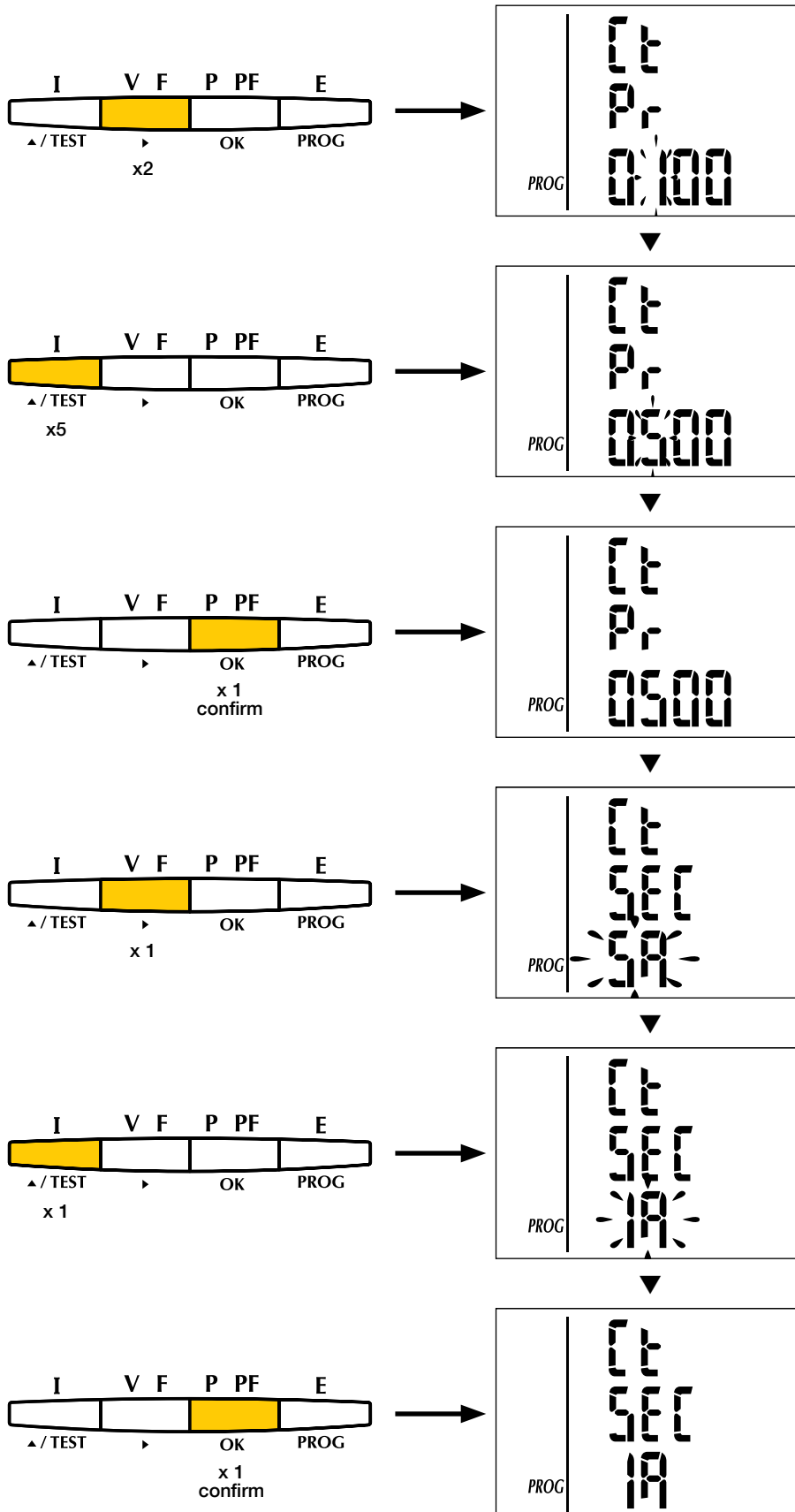
In this example, network change from 4NBL to 3NBL:



7.4. Example: choice of voltage transformer

In programming mode (see page 10), access to screen "Voltage transformer - Ct"

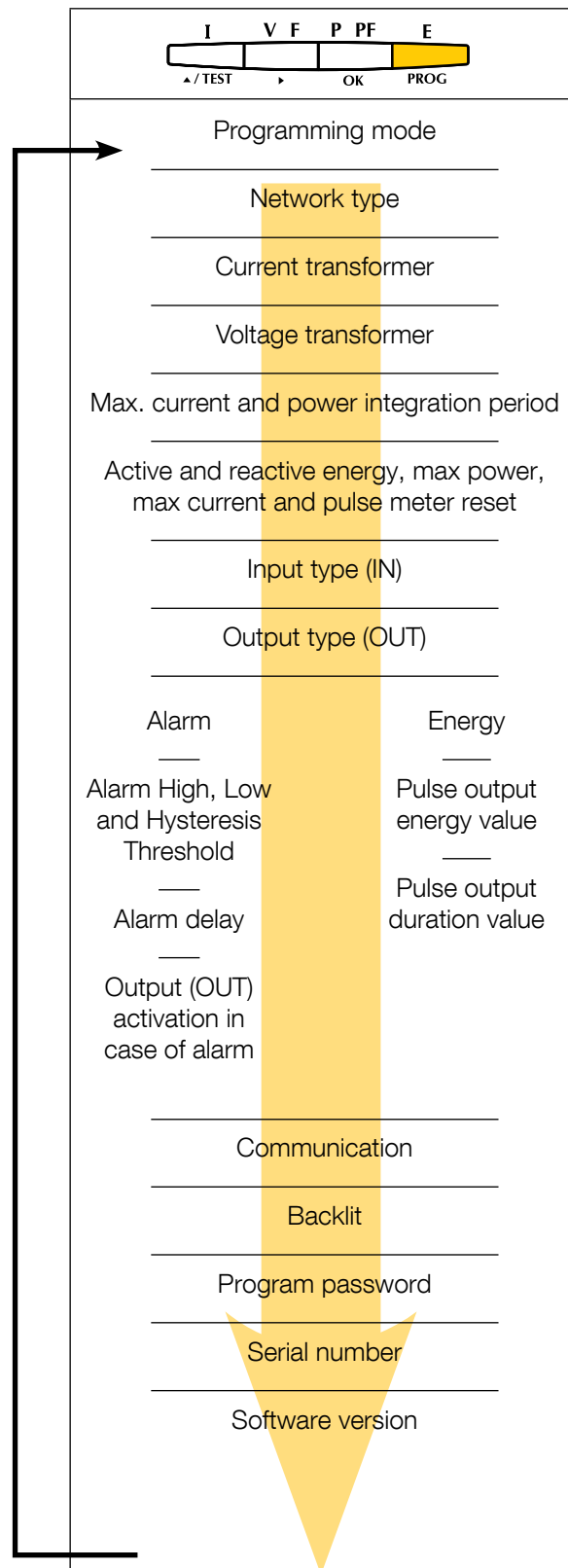
Example: ratio change to 500/1.



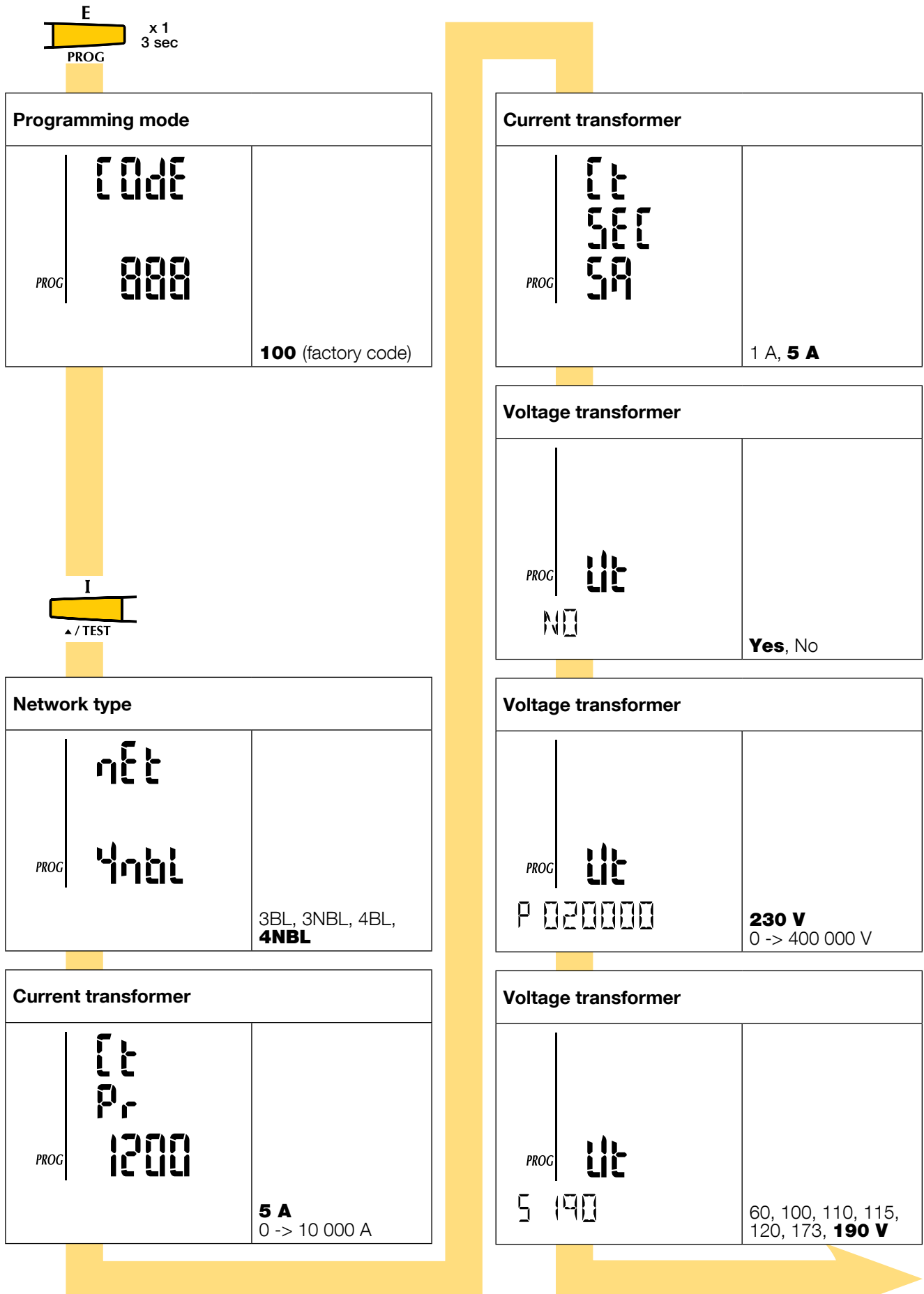
7.5. Programming mode overview

By pressing "E/PROG" button for 3 seconds, device will enter the programming mode. Default code is: 100.

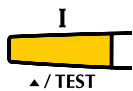
Different screens are accessed by pressing "PROG":



7.6. Detailed view of the programming menu



XX = default value



| Max. current integration time | |
|-------------------------------|--|
| PROG | t IME 20 |
| | 20, 30, 60, 2, 5, 8, 10, 15 min |

| Current max reset | |
|-------------------|------------------|
| PROG | rSet 31 n0 |
| | Yes, No |

| Max. power integration time | |
|-----------------------------|--|
| PROG | t IME P 10 |
| | 20, 30, 60, 2, 5, 8, 10, 15 min |

| Pulse meter reset | |
|-------------------|--------------------|
| PROG | rSet PULS n0 |
| | Yes, No |

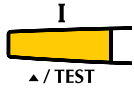
| Active / reactive energy reset | |
|--------------------------------|------------------|
| PROG | rSet EA n0 |
| | rSet Er n0 |
| | Yes, No |

| Input type (IN) | |
|-----------------|---|
| PROG | In tYPE PULS |
| | <i>No: no activation</i> <i>Puls: pulse</i> <i>cd: status change</i> No, puls, cd |

| Power max reset | |
|-----------------|-----------------|
| PROG | rSet P n0 |
| | Yes, No |

| Output type (OUT) | |
|-------------------|--|
| PROG | Out tYPE EA |
| | <i>Ea: active energy</i> <i>Er: reactive energy</i> <i>Alarm: status change if alarm</i> EA, ER, Alarm |

XX = default value



| Alarm type | |
|-------------------------------|--|
| ALAr tYPE 1 PROG | Value alarm I, In, P , Q, S, Capacitive PF, Inductive PF, THDI, THDU, THDV, cd |

| Alarm high threshold | |
|--------------------------------|-------------------------|
| ALAr Ht 1330 PROG | 237 0 -> 9999 |

| Alarm low threshold | |
|--------------------------------|-------------------------|
| ALAr Lt 0459 PROG | 223 0 -> 9999 |

| Alarm hysteresis threshold | |
|--------------------------------|------------------------|
| ALAr Hyst 15 PROG | 1% 0% -> 99% |

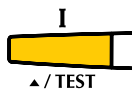
| Alarm delay | |
|---------------------------------|------------------------------------|
| ALAr tENP 600 PROG | 2,4 sec 0.01 -> 99.9 sec |

| Output (OUT) activation in case of alarm | |
|--|----------------|
| ALAr no PROG | Yes, No |

| Pulse output energy value | |
|--------------------------------|---|
| PULS VAL 100 PROG | 0: 0.1 kWh/kvarh 1: 1 kWh/kvarh 2: 10 kWh/kvarh 3: 100 kWh/kvarh 4: 1000 kWh/kvarh 5: 10000 kWh/ kvarh |

| Pulse output duration value | |
|--------------------------------|------------------------|
| PULS dur 200 PROG | 100 -> 900 msec |

XX = default value



| Communication | |
|---------------|---|
| PROG | <div style="text-align: center;"> <p>CON</p> <p>Adr</p> <p>123</p> </div> <p><i>Product address on MODBUS network</i></p> <p>1 -> 247</p> |

| Backlit | |
|---------|---|
| PROG | <div style="text-align: center;"> <p>bAC</p> <p>Lit</p> <p>Std</p> </div> <p><i>Standard: remains ON</i> <i>Auxiliary: switches OFF after a few seconds</i></p> <p>Standard, Auxiliary</p> |

| Communication | |
|---------------|---|
| PROG | <div style="text-align: center;"> <p>CON</p> <p>bds</p> <p>96</p> </div> <p><i>Baud Rate</i></p> <p>1.2, 2.4, 4.8, 9.6, 19.2, 38.4 kbaud</p> |

| Program password | |
|------------------|--|
| PROG | <div style="text-align: center;"> <p>PASS</p> <p>CHG</p> <p>250</p> </div> <p>100 0 -> 999</p> |

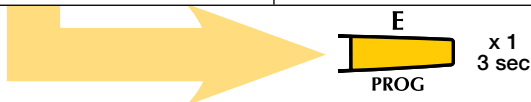
| Communication | |
|---------------|---|
| PROG | <div style="text-align: center;"> <p>CON</p> <p>PAR</p> <p>no</p> </div> <p><i>Parity</i></p> <p>No, Even, Odd</p> |

| Serial number | |
|---------------|---|
| PROG | <div style="text-align: center;"> <p>3 131</p> <p>6 101</p> <p>00 12</p> </div> |

| Communication | |
|---------------|--|
| PROG | <div style="text-align: center;"> <p>CON</p> <p>StOP</p> <p>1</p> </div> <p><i>Stop bit</i></p> <p>1, 2</p> |

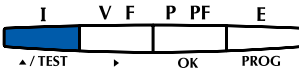
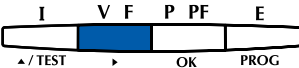

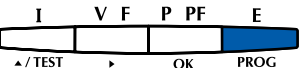
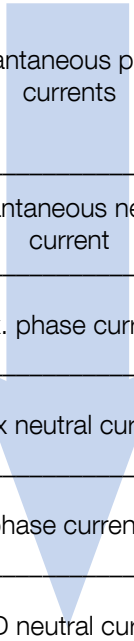
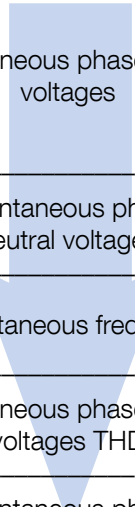
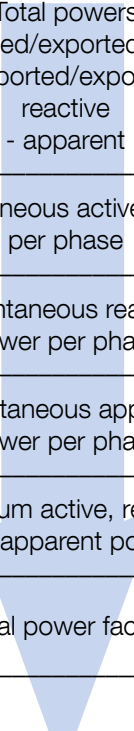
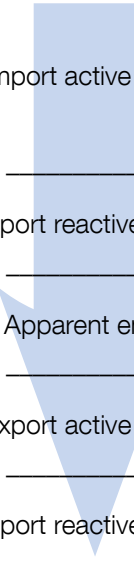
| Software version | |
|------------------|---|
| PROG | <div style="text-align: center;"> <p>SOFT</p> <p>U 104</p> </div> |

XX = default value

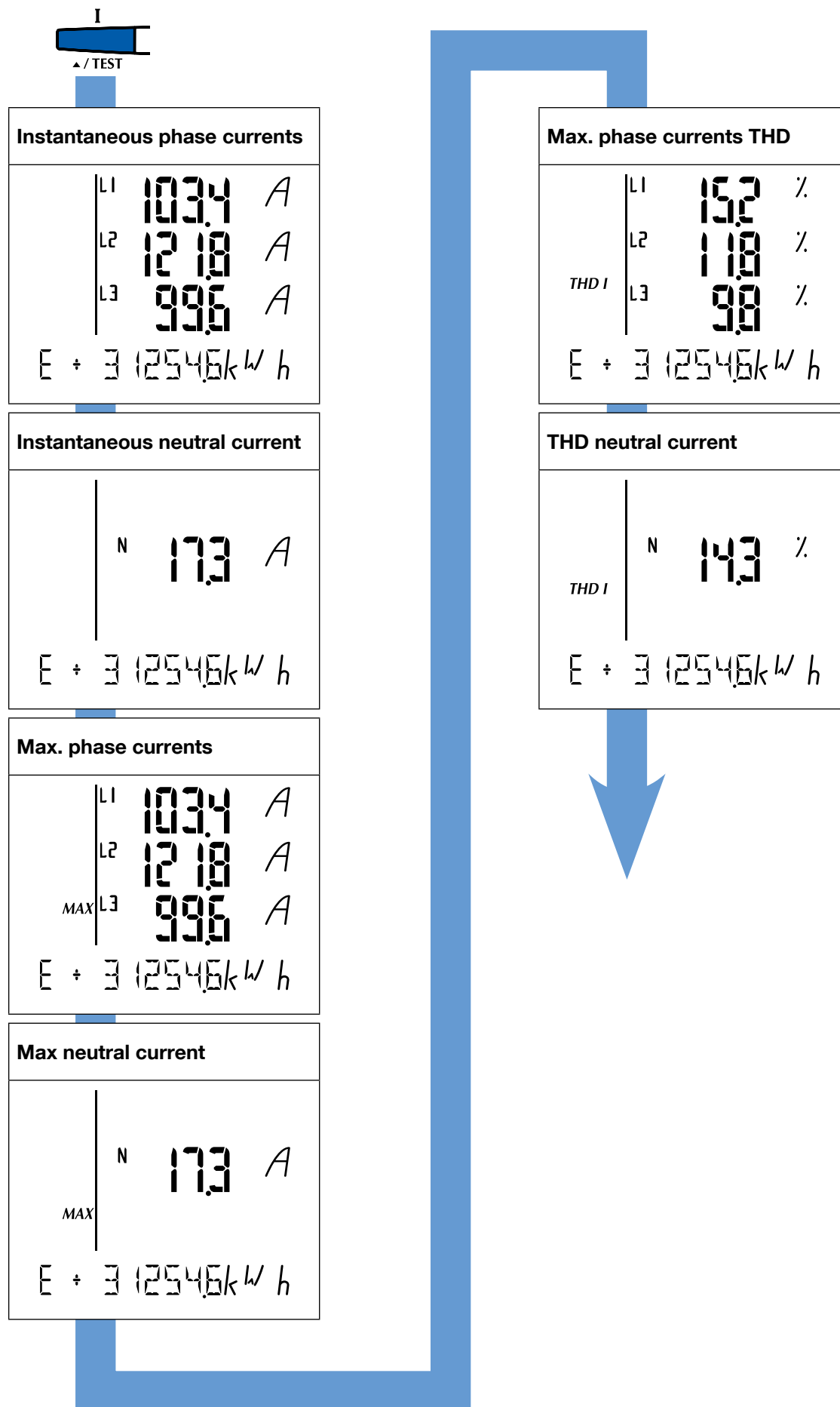


8. Use

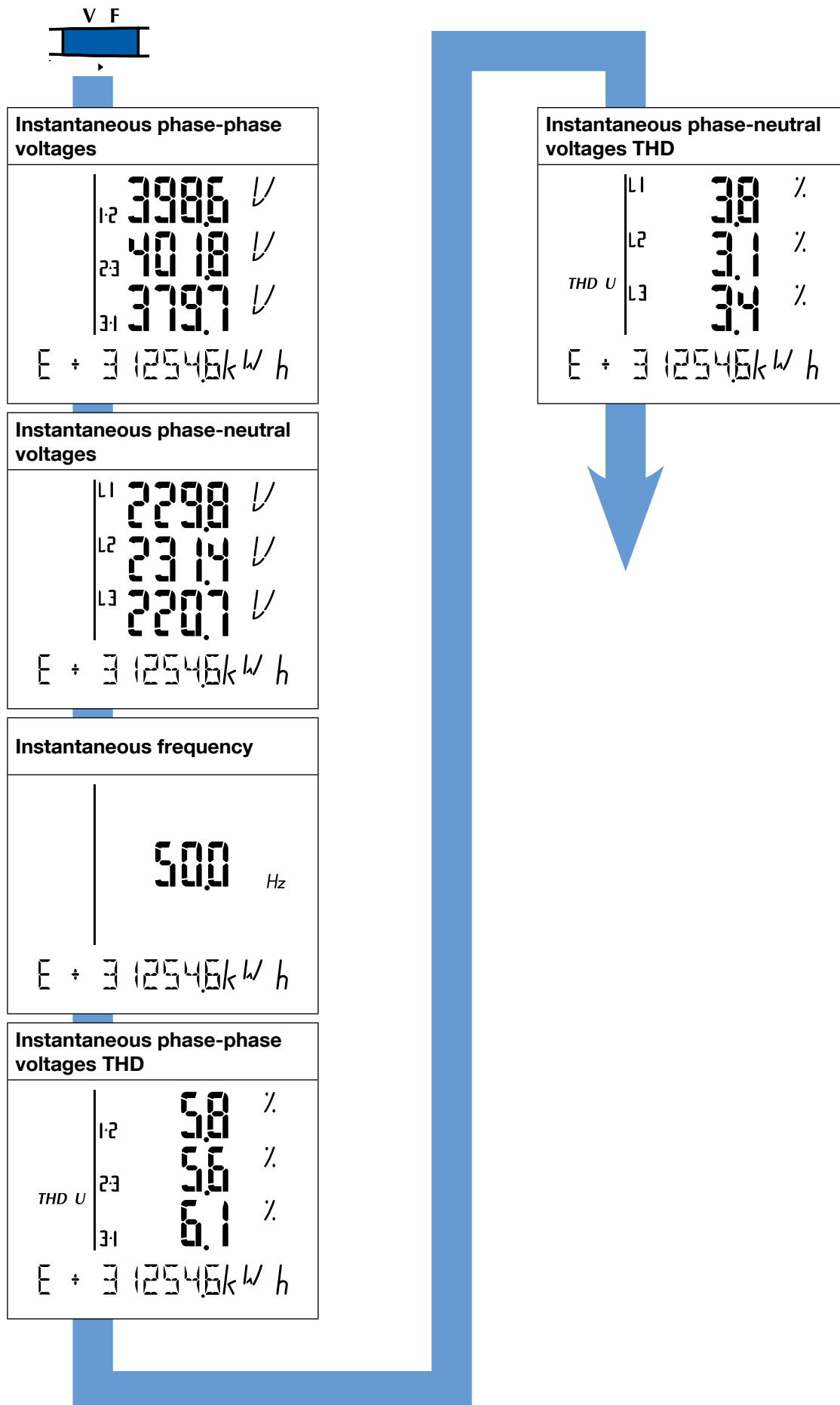
The measurement values are accessible via dedicated buttons: **Current, Voltage, Power and Energy**. By pressing the appropriate button several times all the measurement relative to this button can be displayed. All the available measurements are described in the following diagram:

| Current | Voltage | Power | Energy |
|--|--|---|--|
|  |  |  |  |
| <div style="text-align: center;">  </div> <p>Instantaneous phase currents</p> <hr/> <p>Instantaneous neutral current</p> <hr/> <p>Max. phase currents</p> <hr/> <p>Max neutral current</p> <hr/> <p>Max. phase currents THD</p> <hr/> <p>THD neutral current</p> | <div style="text-align: center;">  </div> <p>Instantaneous phase-phase voltages</p> <hr/> <p>Instantaneous phase-neutral voltages</p> <hr/> <p>Instantaneous frequency</p> <hr/> <p>Instantaneous phase-phase voltages THD</p> <hr/> <p>Instantaneous phase-neutral voltages THD</p> | <div style="text-align: center;">  </div> <p>Total powers - imported/exported active, - imported/exported reactive - apparent</p> <hr/> <p>Instantaneous active power per phase</p> <hr/> <p>Instantaneous reactive power per phase</p> <hr/> <p>Instantaneous apparent power per phase</p> <hr/> <p>Maximum active, reactive and apparent power</p> <hr/> <p>Total power factor</p> <hr/> <p>Instantaneous power factor per phase</p> | <div style="text-align: center;">  </div> <p>Import active energy</p> <hr/> <p>Import reactive energy</p> <hr/> <p>Apparent energy</p> <hr/> <p>Export active energy</p> <hr/> <p>Export reactive energy</p> <hr/> <p>Pulse meter connected to the input</p> |

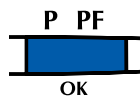
8.1. Detailed view of the "Current" menu



8.2. Detailed view of the "Voltage" menu



8.3. Detailed view of the "Power" menu



Total powers - imported/exported active, - imported/exported reactive - apparent

| | |
|----------|-------------|
| | 675 kW |
| | 305 kVar |
| Σ | 74.1 kVA |
| E ÷ | 3 12546 kWh |

Instantaneous active power per phase

| | | |
|-----|----|-------------|
| | L1 | 219 kW |
| | L2 | 256 kW |
| | L3 | 204 kW |
| E ÷ | | 3 12546 kWh |

Instantaneous reactive power per phase

| | | |
|-----|----|-------------|
| | L1 | 92 kVar |
| | L2 | 116 kVar |
| | L3 | 85 kVar |
| E ÷ | | 3 12546 kWh |

Instantaneous apparent power per phase

| | | |
|-----|----|-------------|
| | L1 | 238 kVA |
| | L2 | 28.1 kVA |
| | L3 | 22.1 kVA |
| E ÷ | | 3 12546 kWh |

Maximum active, reactive and apparent power

| | | |
|--------------|----|-------------|
| | L1 | 985 kW |
| | L2 | 357 kVar |
| Σ MAX | L3 | 116.3 kVA |
| E ÷ | | 3 12546 kWh |

Total power factor

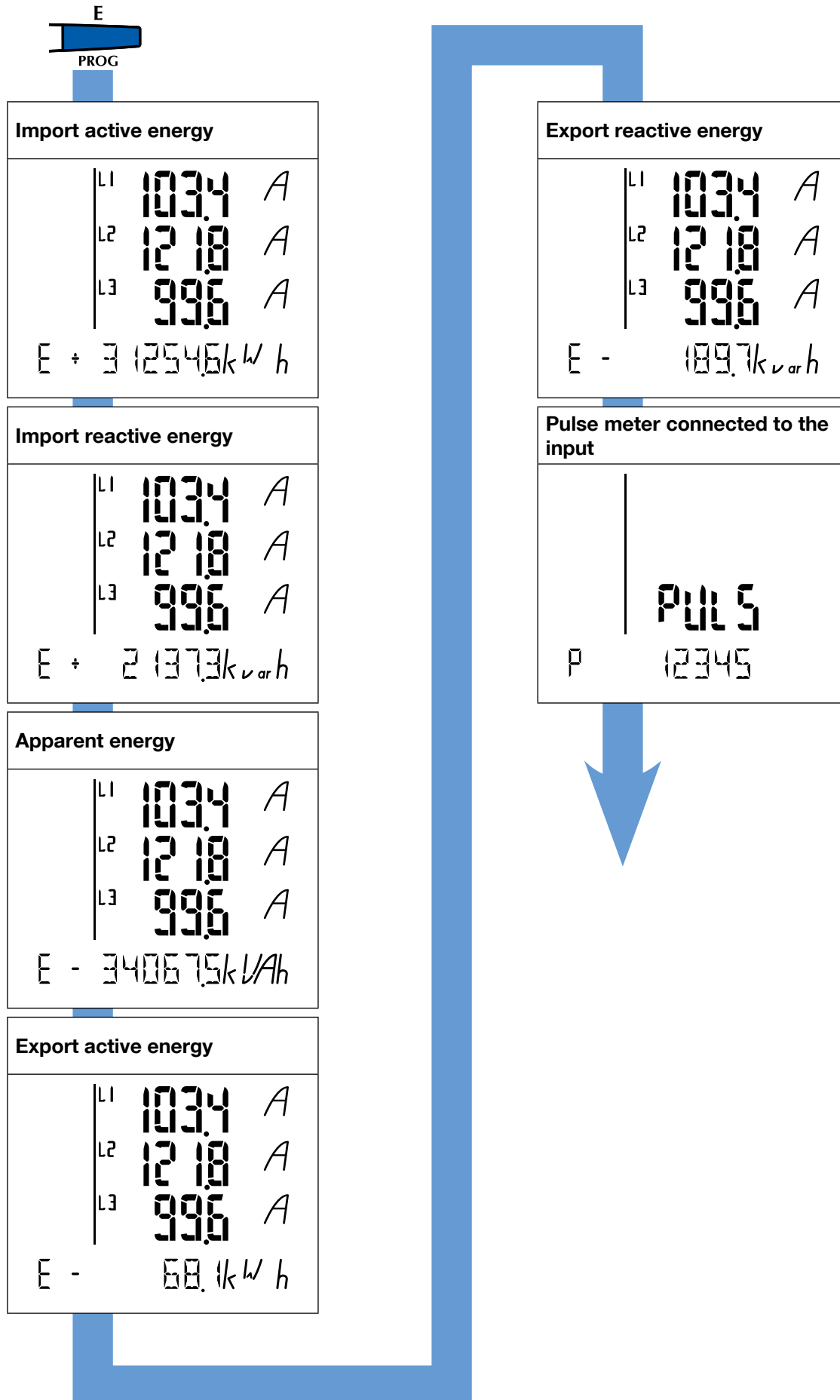
| | |
|----------|-------------|
| Σ | 0.91 PF |
| E ÷ | 3 12546 kWh |

Instantaneous power factor per phase

| | | |
|-----|----|-------------|
| | L1 | 0.92 PF |
| | L2 | 0.91 PF |
| | L3 | 0.92 PF |
| E ÷ | | 3 12546 kWh |



8.4. Detailed view of the "Energy" menu



9. Connection test function

During the test, the DIRIS must have current and voltage for each of the phases.

In addition to this, the function recognises the PF of the installation as being between $0.6 < PF < 1$. If the PF of the installation is not within this range, this function cannot be used.

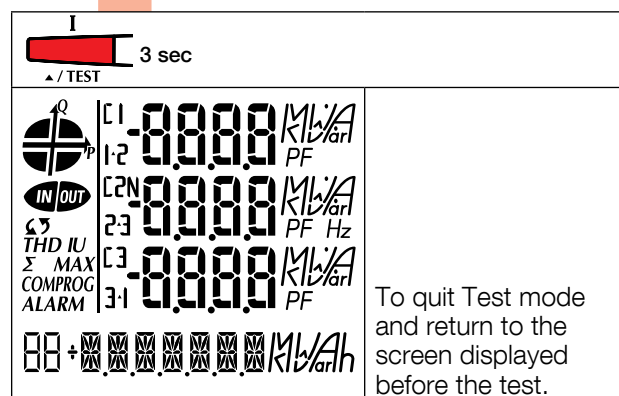
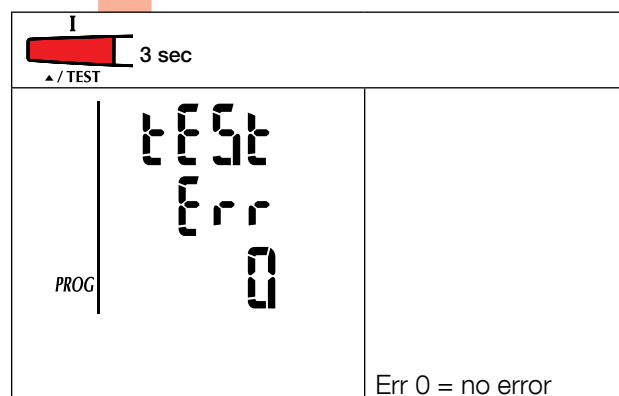
- In 4 BL / 3 BL, only the connection of the CTs is controlled.
- In 4NBL and 3NBL the connection as a whole is controlled.

- Err 0 = no error
- Err 1 = CT phase 1 inverted
- Err 2 = CT phase 2 inverted
- Err 3 = CT phase 3 inverted
- Err 4 = V1 and V2 voltages inverted
- Err 5 = V2 and V3 voltages inverted
- Err 6 = V3 and V1 voltages inverted

- Errors 1, 2 and 3 must be corrected manually by reversing CT connections.
- Errors 4, 5 and 6 must be corrected manually by modifying voltage connections.

First test operation

Press the TEST button for 3 seconds. The error indication is displayed on the screen.



I 3 sec
▲ / TEST

| | |
|--|---------------------------------------|
| | The screen displays the error number. |
|--|---------------------------------------|

V F 1 x

| | |
|--|---|
| | To automatically change the TC current, change the value NO to YES. |
|--|---|

P PF 1 x
OK

| | |
|--|------------------|
| | Err 0 = no error |
|--|------------------|

I 3 sec
▲ / TEST

| | |
|--|---|
| | To quit Test mode and return to the screen displayed before the test. |
|--|---|



Second test operation

Note: this menu only appears if the test has already been done.

| | |
|--|--|
| | |
| | <p>To perform the test a second time</p> |

| | |
|--|--|
| | |
| | <p>To start the second test, change the value to YES</p> |

| | |
|--|-------------------------|
| | |
| | <p>Err 0 = no error</p> |

| | |
|--|--|
| | |
| | <p>To quit Test mode and return to the screen displayed before the test.</p> |



10. Assistance

| Causes | Solutions |
|---------------------------------------|---|
| Backlight switched off | Check backlight configuration |
| Voltages displayed = 0 V or incorrect | Verify the connections and the CT configuration. |
| Currents displayed = 0 A or incorrect | Verify the connections Verify the CT configuration |
| Powers and power-factor (PF) | Use the test connection function (see page 23) |
| Phases missing on Display | Check the network configuration (see page 11) |
| I/O are not operating | Check power supply 8 - 30VDC |

11. Electrical and Technical characteristics

| | |
|--|-----------------------------|
| Type | Panel mounting |
| Dimensions W x H x D | 72 x 72 x 60 mm |
| Case degree of protection | IP30 |
| Front degree of protection | IP52 |
| Display type | backlit LCD display |
| Terminal block type | fixed or plug-in |
| Voltage and other connection cross-section | 0.2 ... 2.5 mm ² |
| Current connection cross-section | 0.5 ... 6 mm ² |
| Weight | 400 g |

Current measurement (TRMS)

| | |
|-----------------------------|---------------------------|
| Via CT with primary up to | 9 999 A |
| Via CT with secondary | 1 or 5 A |
| Measurement range | 0 ... 11 kA |
| Input consumption | 0.6 VA |
| Measurement updating period | 1 s |
| Accuracy at 50 Hz | 0,5 % |
| Accuracy at 60 Hz | 1 % |
| Permanent overload | 6 A |
| Intermittent overload | 10 I _n for 1 s |

Voltage measurements (TRMS)

| | |
|--|----------------------------|
| Direct measurement between phases | 69 ... 690 VAC |
| Direct measurement between phase and neutral | 40 ... 400 VAC |
| VT primary | 400 000 VAC |
| VT secondary | 60, 100, 110, 173, 190 VAC |
| Input consumption | ≤ 0.1 VA |
| Measurement updating period | 1 s |
| Accuracy at 50 Hz | 0,5 % |
| Accuracy at 60 Hz | 1 % |
| Permanent overload | 800 VAC |

Power measurement

| | |
|-----------------------------|-----|
| Measurement updating period | 1 s |
| Accuracy at 50 Hz | 1 % |
| Accuracy at 60 Hz | 2 % |

Power factor measurement

| | |
|-----------------------------|-------|
| Measurement updating period | 1 s |
| Accuracy at 50 Hz | 0,5 % |
| Accuracy at 60 Hz | 1 % |

Frequency measurement

| | |
|-----------------------------|--------------|
| Measurement range | 45 ... 65 Hz |
| Measurement updating period | 1 s |
| Accuracy | 0,1 % |

Energy accuracy

| | |
|---------------------------------------|---------|
| Active (as per IEC 62053-21) at 50 Hz | Class 1 |
| Active (as per IEC 62053-21) at 60 Hz | Class 2 |
| Reactive (according to IEC 62053-23) | Class 2 |

Operating conditions

| | |
|---------------------------|------------------|
| Operating temperature | - 10 ... + 55 °C |
| Storage temperature range | - 20 ... + 85 °C |
| Relative humidity | 95 % |

Auxiliary power supply

| | |
|---------------------|-----------------|
| Alternating voltage | 220 ... 277 VAC |
| AC tolerance | ± 15 % |
| Frequency | 50 / 60 Hz |
| Consumption | 3 VA |

Digital pulse and control input

| | |
|-----------------------------------|-------------------------|
| Number | 1 |
| Type of power supply | Optocoupler 8 to 30 VDC |
| Minimum signal width | 10 ms |
| Minimum duration between 2 pulses | 18 ms |

Communication

| | |
|---------------|---------------------------|
| Link | RS485 |
| Type | 2 ... 3 half duplex wires |
| Protocol | MODBUS RTU |
| MODBUS® speed | 1200 ... 38400 bauds |

Pulse, alarm and control output

| | |
|-----------------------------------|---|
| Number | 1 |
| Type of power supply | Optocoupler 8 to 30 VDC |
| Minimum signal width | 10 ms |
| Minimum duration between 2 pulses | 18 ms |
| Type of optocoupler | IEC 62053-31 Class A (5 ... 30 VDC) |
| Pulse weight | 100 Wh, 1 kWh, 10 kWh, 100 kWh, 1000 kWh, 10000 kWh |
| Pulse length | 100 ms, 200 ms, 300 ms, ..., 900 ms |

12. According to IEC 61557-12

IEC 61557-12 Edition 1 (08/2007) COMPLIANCE

| | |
|-----------------------------|-----|
| Performance criteria | |
| PMD classification | SD |
| Temperature | K55 |

CHARACTERISTICS OF THE FUNCTIONS

| Symbol for functions | Measurement range | Operational performance class |
|----------------------|--|-------------------------------|
| P | 10% to 120% In | 1 |
| Qa, Qv | 10% to 120% In | 1 |
| Sa, Sv | 10% to 120% In | 1 |
| Ea | 0 to 99999999 kwh | 1 |
| Era, Erv | 0 to 99999999 kwh | 2 |
| Eapa, Eapv | - | - |
| f | 45 to 65 Hz | 0,1 |
| I | 10% to 120% In | 0,5 |
| IN | - | - |
| INc | 10% to 120% In | 1 |
| U | 46 to 520Vac ph/ph | 0,5 |
| Pfa, Pfv | 0.5 ind to 0.8 cap | 0,5 |
| Pst, Plt | - | - |
| Udip, Uswl | - | - |
| Utr, Uint | - | - |
| Unba, Unb | - | - |
| Un | - | - |
| THDu | Fn = 50Hz - ranks 1 to 31 Fn = 60Hz - ranks 1 to 31 | 1 |
| THD-Ru | - | - |
| Ih | - | - |
| THDi | Fn = 50Hz - ranks 1 to 31 Fn = 60Hz - ranks 1 to 31 | 1 |
| THD-Ri | - | - |
| Msv | - | - |

13. Glossary of abbreviations

| | |
|--------------------|--|
| nEt | Type of network |
| 4NBL | Unbalanced three-phase network, 4 wires with 3 CT |
| 4BL | Balanced three-phase network, 4 wires with 1 CT |
| 3NBL | Unbalanced three-phase network, 3 wires with 2 or 3 CT |
| 3BL | Balanced three-phase network, 3 wires with 1 CT |
| Ct | Current transformer |
| MAX | Maximum average values |
| tIME 4I | Integration times for average and maximum current values |
| tIME P | Integration times for mean and maximum power values |
| rSET | Reset |
| MAX P | Active power maximum mean value |
| EA | Active energy (kWh) |
| ER | Reactive energy (kvarh) |
| AUX | Auxiliary supply |
| bACLI | Backlit |
| SErI | Serial number |
| SOft | Software version |
| THD I1, I2, I3, In | Current harmonic distortion rate |
| THD U12, U23, U31 | Phase-to-phase voltage harmonic distortion rate |
| THD V1, V2, V3 | Phase-to-neutral voltage harmonic distortion rate |
| COM | Communication |
| ADR | Slave address |
| BDS | Communication speed (baud) |
| PAR | Communication frame parity |
| NO | Without parity |
| Even | Even parity |
| Odd | Odd parity |
| STOP | Frame-stop beep |
| 1 | 1 stop bit |
| 2 | 2 stop bits |

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